

## LETTERS

humans. Additionally, *Mycobacteria* spp. can occasionally cause disease in humans through contact with fish (*M. marinum*), and pedicure treatments have previously been associated with *M. fortuitum* infections (10).

Recently, the risks associated with exposure to *G. rufa* fish were reported to be low (1). To date, there are only a limited number of reports of patients who might have been infected by this exposure route (1). However, our study raises some concerns over the extent that these fish, or their transport water, might harbor potential zoonotic disease pathogens of clinical relevance. In particular, patients with underlying conditions (such as diabetes mellitus or immunosuppression) should be discouraged from undertaking such treatments, especially if they have obvious breaks in the skin or abrasions. This risk can probably be reduced by use of certified disease-free fish reared in controlled facilities under high standards of husbandry and welfare.

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## References

1. Health Protection Agency Fish Spa Working Group. Guidance on the management of the public health risks from fish pedicures: draft for consultation. 2011 Aug 31 [cited 2012 Mar 21]. [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317131045549](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131045549)
2. Jones N, Bohnsack JF, Takahashi S, Oliver KA, Chan MS, Kunst F, et al. Multilocus sequence typing system for group B *Streptococcus*. J Clin Microbiol. 2003;41:2530–6. <http://dx.doi.org/10.1128/JCM.41.6.2530-2536.2003>
3. Evans JJ, Bohnsack JF, Klesius PH, Whiting AA, Garcia JC, Shoemaker CA, et al. Phylogenetic relationships among *Streptococcus agalactiae* isolated from piscine, dolphin, bovine and human sources: a dolphin and piscine lineage associated with a fish epidemic in Kuwait is also associated with human neonatal infections in Japan. J Med Microbiol. 2008;57:1369–76. <http://dx.doi.org/10.1099/jmm.0.47815-0>
4. Janda JM, Abbott SL. The genus *Aeromonas*: taxonomy, pathogenicity, and infection. Clin Microbiol Rev. 2010;23:35–73. <http://dx.doi.org/10.1128/CMR.00039-09>
5. Jones MK, Oliver JD. *Vibrio vulnificus*: disease and pathogenesis. Infect Immun. 2009;77:1723–33. <http://dx.doi.org/10.1128/IAI.01046-08>
6. Morris JG. Non-O group-1 *Vibrio cholera*—a look at the epidemiology of an occasional pathogen. Epidemiol Rev. 1990;12:179–91.
7. Wagner D, Young LS. Nontuberculous mycobacterial infections: a clinical review. Infection. 2004;32:257–70. <http://dx.doi.org/10.1007/s15010-004-4001-4>
8. Skoff TH, Farley MM, Petit S, Craig AS, Schaffner W, Gershman K, et al. Increasing burden of invasive group B streptococcal disease in non-pregnant adults, 1990–2007. Clin Infect Dis. 2009;49:85–92. <http://dx.doi.org/10.1086/599369>
9. Verner-Jeffreys DW, Welch TJ, Schwarz T, Pond MJ, Woodward MJ, Haig SJ, et al. High prevalence of multidrug-tolerant bacteria and associated antimicrobial resistance genes isolated from ornamental fish and their carriage water. PLoS ONE. 2009;4:e8388. <http://dx.doi.org/10.1371/journal.pone.0008388>
10. De Groote MA, Huitt G. Infections due to rapidly growing mycobacteria. Clin Infect Dis. 2006;42:1756–63. <http://dx.doi.org/10.1086/504381>

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## *Rickettsia conorii* Indian Tick Typhus Strain and *R. slovaca* in Humans, Sicily

**To the Editor:** Rickettsiae are vector-borne pathogens that affect humans and animals worldwide (1). Pathogens in the *Rickettsia conorii* complex are known to cause Mediterranean spotted fever (MSF) (*R. conorii* Malish strain), Astrakhan fever (*R. conorii* Astrakhan strain), Israeli spotted fever (*R. conorii* Israeli spotted fever strain), and Indian tick typhus (*R. conorii* Indian tick typhus strain) in the Mediterranean basin and Africa, southern Russia, the Middle East, and India and Pakistan, respectively (2). These rickettsioses share some clinical features, such as febrile illness and generalized cutaneous rash, and are transmitted to humans by *Rhipicephalus* spp. ticks (2).

MSF is endemic to Sicily (Italy); fatal cases occur each year, and the prevalence of *R. conorii* in dogs is high (3–6). Recently, *R. conorii* Malish strain and *R. conorii* Israeli spotted fever strain were confirmed in humans in Sicily in whom MSF was diagnosed (4), which suggests that other *R. conorii* strains might be present and diagnosed as causing MSF. The rickettsiae within the *R. conorii* complex, which are relevant for the study of bacterial evolution and epidemiology, can be properly identified only by appropriate genetic analyses.



of the *Rickettsia* spp. we identified. As shown (2), multilocus analysis with *ompA-ompB* sequences was highly informative about the phylogenetic relationship between *Rickettsia* spp. and *R. conorii* strains (Figure, panel B).

In Sicily, *R. conorii* Malish strain has been characterized in MSF patients (4), and *R. slovaca* DNA was identified in ixodid ticks (5). However, to our knowledge, *R. slovaca* in humans in Sicily and *R. conorii* Indian tick typhus strain infection in Sicily and Europe have not been reported. The only previous report outside India and Pakistan was documented in a traveler with severe clinical manifestations in France (10). Differences were not observed between *R. conorii* Indian tick typhus strain and *R. slovaca*-infected patients. Both patients had similar clinical symptoms compatible with MSF; in both, only IgM for rickettsiae was detected at hospital admission, but IgM and IgG were detected during convalescence. Tache noire were detected in the neck and right arm of patients with *R. conorii* Indian tick typhus strain and *R. slovaca*, respectively.

These results demonstrated that new rickettsiae, such as *R. conorii* Indian tick typhus strain, of public health relevance are emerging in Europe. The widespread distribution of tick vectors in Europe and the transstadial and transovarial transmission of the pathogen in ticks might favor transmission to humans.

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## References

- Nicholson WL, Allen KE, McQuiston JH, Breitschwerdt EB, Little SE. The increasing recognition of rickettsial pathogens in dogs and people. *Trends Parasitol.* 2010;26:205–12. <http://dx.doi.org/10.1016/j.pt.2010.01.007>
- Zhu Y, Fournier PE, Ereemeeva M, Raoult D. Proposal to create subspecies of *Rickettsia conorii* based on multilocus sequence typing and an emended description of *Rickettsia conorii*. *BMC Microbiol.* 2005;5:11. <http://dx.doi.org/10.1186/1471-2180-5-11>
- Ciceroni L, Pinto A, Ciarrocchi S, Ciervo A. Current knowledge of rickettsial diseases in Italy. *Ann N Y Acad Sci.* 2006;1078:143–9. <http://dx.doi.org/10.1196/annals.1374.024>
- Giammanco GM, Vitale G, Mansueto S, Capra G, Caleca MP, Ammatuna P. Presence of *Rickettsia conorii* subsp. *israelensis*, the causative agent of Israeli spotted fever, in Sicily, Italy, ascertained in a retrospective study. *J Clin Microbiol.* 2005;43:6027–31. <http://dx.doi.org/10.1128/JCM.43.12.6027-6031.2005>
- Beninati T, Genchi C, Torina A, Caracappa S, Bandi C, Lo N. Rickettsiae in ixodid ticks, Sicily. *Emerg Infect Dis.* 2005;11:509–11. <http://dx.doi.org/10.3201/eid1103.040812>
- Tzianabos T, Anderson BE, McDade JE. Detection of *Rickettsia rickettsii* DNA in clinical specimens by using polymerase chain reaction technology. *J Clin Microbiol.* 1989;27:2866–8.
- Fernández de Mera IG, Zivkovic Z, Bolaños M, Carranza C, Pérez-Arellano JL, Gutiérrez C, et al. *Rickettsia massiliae* in the Canary Islands. *Emerg Infect Dis.* 2009;15:1869–70.
- Roux V, Fournier PE, Raoult D. Differentiation of spotted fever group rickettsiae by sequencing and analysis of restriction fragment length polymorphism of PCR-amplified DNA of the gene encoding the protein rOmpA. *J Clin Microbiol.* 1996;34:2058–65.
- Choi YJ, Jang WJ, Ryu JS, Lee SH, Park KH, Paik HS, et al. Spotted fever group and typhus group rickettsioses in humans, South Korea. *Emerg Infect Dis.* 2005;11:237–44. <http://dx.doi.org/10.3201/eid1102.040603>
- Parola P, Fenollar F, Badiaga S, Brouqui P, Raoult D. First documentation of *Rickettsia conorii* infection (strain Indian tick typhus) in a traveler. *Emerg Infect Dis.* 2001;7:909–10. <http://dx.doi.org/10.3201/eid0705.010527>

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## Detection of European Strain of *Echinococcus multilocularis* in North America

**To the Editor:** In 2009, an alveolar hydatid cyst, the intermediate stage of the cestode *Echinococcus multilocularis*, was detected in the liver of a dog from Quesnel, British Columbia (BC), Canada (1), 600 km west of the nearest known record of this parasite in central North America (Figure). Alveolar hydatid cysts normally occur in rodent intermediate hosts. However, humans can serve as aberrant intermediate hosts; cysts generally originate in the liver and, in about one third of cases, metastasize throughout the body (2). Detection of the larval stage of this pathogen in an unusual host in a new geographic region required application of multiple molecular epidemi-